Software Design Document

NSW Traffic Penalty Visualizer

Student Names

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# System Vision

## Problem Background

Traffic management and road safety are critical concerns for New South Wales (NSW), Australia. To address these challenges effectively, my project aims to develop a data analysis and data visualization tool using the NSW Traffic Penalty Data. This system will provide valuable insights into traffic violations, penalties and trends, helping traffic authorities, policymakers and the public make informed decisions.

## System Overview

The system, referred to as the “Traffic Data Analyzer” will offer a user-friendly interface for interacting with the NSW Traffic Penalty Data. IT will allow users to analyse penalty information, visualize offense code distributions, retrieve cases captured by radar or camera based on offense descriptions, and conduct in-depth analyses related to mobile phone usage violations.

## Potential Benefits

The Traffic Data Analyzer holds the potential to provide several benefits:

* Enhanced Traffic Management: Traffic authorities can use the tool to gain insights into traffic violation patterns and optimize enforcement efforts.
* Informed Decision-Making: Policymakers can access data-driven insights to formulate effective road safety policies and initiatives.
* Public Awareness: The tool can provide the public with a better understanding of traffic penalties and encourage safer driving habits.
* Efficiency: The system’s user interface and reporting capabilities streamline the process of accessing and analysing traffic penalty data.

# Requirements

In this section, we define the key requirements for the Traffic Data Analyser system.

## User Requirements

User Requirements represent the needs and expectations of the system’s users. These requirements guide the design and functionality of the user interface and the overall user experience.

* + 1. User Input
    2. Data Retrieval
    3. Visualization
    4. Mobile Phone Usage Analysis
    5. Additional Insight Tool

## Software Requirements

* + 1. Functional Requirements
    2. Non-Functional Requirements

## Use Cases & Use Case Diagrams

# Software Design and System Components

## Software Design

A block diagram/flowchart of how your software might work

## System Components

### Functions

Preliminary list of all functions in the software. For each function in the list the following information is provided:

* a brief description of what it does (1 or 2 sentences);
* a list of the input parameters, and their data types, and what they are used for;
* a list of any side effects caused by the function (ie change global or member variables, changes data passed by reference from calling function etc)
* a description of the function’s return value

### Data Structures / Data Sources

List of all data structures in the software (eg linked lists, trees, arrays etc) or eternal data sources. For each data structure in the list the following information is provided:

* Type of structure (tree, list etc),
* Description of where and how it is used
* List of data members, and what each one is for do
* List of functions that use it

### Detailed Design

Pseudocode for all non-standard / non-trivial algorithms that operate on data structures

# User Interface Design

This is your initial interface design. Describe the tools you used for this design stage and any key findings that informed your design. This introduction is descriptive and should explain what you have completed for the actual design work you will present in the sub-sections below.

## Structural Design

Structural design refers to the navigational and information structure of your product – the structure that supports the interface layout. How will you structure your product? How will you group your information? How will you navigate through your product? Why? This can take the form of a diagram showing structure and hierarchy, supported by a discussion and justification of your choices. Why have you made these design choices? Describe and outline the structure of your interface and of your information.

## Visual Design

Detail your visual design: Layout, visual elements, icons, graphics, style, colour, fonts general screen designs. This can be sketches, wireframes, mockups etc, supported by a discussion, explanation, and justification of your choices.